

Coast Guard, DOT**§ 153.1608**

that no tank in the block be washed until all the tanks in the block have been discharged.

(c) Include any water that is trapped in dead end pipe sections, either by—

(1) Draining the pipe sections and adding the water to that collected in the container under paragraphs (b)(9) and (b)(10) of this section; or

(2) Adding an estimate of the water's volume to the sum calculated in paragraph (d) of this section using the pipe's dimensions, the ship's list and trim, and the geometry of the piping system.

(d) Measure the volume of water collected in the container under paragraphs (b)(9), (b)(10), and (c)(1) of this section and add to that volume the volume, if any, estimated under paragraph (c)(2) of this section.

§ 153.1604 Determining the stripping quantity from the test results.

(a) For a single test, the stripping quantity is the volume of water calculated under § 153.1602(d).

(b) If multiple tests are made on a tank without modifications to the tank, pumping system, or stripping procedure between the tests, the stripping quantity must be taken as the average of the stripping quantities for all of the tests.

(c) If multiple tests are made on a tank with modifications to the tank, pumping system, or stripping procedure between the tests, the stripping quantity is the stripping quantity de-

termined under paragraph (b) of this section using only those tests performed after the last modification.

§ 153.1608 Calculation of total NLS residue and clingage NLS residue.

(a) The total NLS residue for each tank is calculated by adding the stripping quantity and the clingage NLS residue.

(b) The clingage NLS residue for each tank is calculated using the following formula:

$$Q_{\text{clingage}} = 1.1 \times 10^{-4} \frac{A_d + 1.5 \times 10^{-5} A_w + 4.5 \times 10^{-4} L^{1/2}}{A_b}$$

where:

A_b =Area of the tank bottom added to the area in square meters of tank structural components projected on a horizontal surface

A_d =Area of the tank underdecks added to the area in square meters of tank structural components projected on a horizontal surface

A_w =Area of the tank walls added to the area in square meters of tank structural components projected on a vertical surface

L =Length of tank in meters from fore to aft

Q_{clingage} =volume of clingage in cubic meters

When using the formula in this paragraph, areas that are inclined more than 30° from the horizontal may be assumed to be vertical.

NOTE: The Commandant (G-MSO) (tel num:202-267-1217) has information that may be useful in approximating surface areas of typical structural members for the projected area calculations under § 153.1608(b).

TABLE 1.—SUMMARY OF MINIMUM REQUIREMENTS

Cargo name	IMO Annex II pollution category	Haz.	Cargo containment system	Ventheight	Vent	Gauge	Fire protection system	Special requirements in 46 CFR Part 153	Electrical hazard class and group
a.	b.	c.	d.	e.	f.	g.	h.	i.	j.
Acetic acid	D	S	III	4m	P/V P Open	Restr Restr Open	A A A	.238(a), .409, .527, .554	I-D
Acetic anhydride	D	S	II	4m	P/V B/3	Restr Closed	A A	.238(a), .409, .526, .527, .554	I-D
Acetochlor	A	P	II	NR	P/V P/V	Restr Closed	A A	.238(a), .316, .336, .408, .525, .526, .527, .912(a)(2), .933, .1002, .1004, .1020, .1035, .409, .525, .526, .1020	NA
Acetone cyanohydrin	A	Sup	II	NR	P/V Open	NSR	NSR	.409, .525(a), (c), (d), (e), .912(a)(1), .1002(a), .1004, .1020, .238(a), .409, .526, .912(a)(1), .1002(a), .1004	I-D
Acetonitrile	II	S	II	B/3	P/V NR	Restr Closed	A A	.238(a), .316, .336, .408, .525, .526, .527, .912(a)(2), .933, .1002, .1004, .1020, .1035, .409, .525, .526, .1020	I-D
Acrylamide solution (50% or less)	D	S	II	4m	P/V B/3	Restr Closed	A A	.238(a), .409, .526, .912(a)(1), .1002(a), .1004	NA
•Acrylic acid	D	S	II	4m	P/V P/V	Restr Closed	A A	.238(a), .409, .526, .912(a)(1), .1002(a), .1004	I-D
Acrylonitrile	B	Sup	II	NR	P/V Open	Restr Open	A A	.236(a), (c), (d), .316, .408, .525, .526, .527, .912(a)(1), .1004, .1020	I-D
Adiponitrile	D	S	II	4m	P/V NR	Restr Open	A A	.238(a), .409, .440, .488, .908(a), (b)	NA
Alachlor technical (90% or more)	B	Sup	II	NR	P/V Open	Restr Open	A A	.238(a), .409, .440, .488, .908(a), (b)	NA
Alcohol (6-C-17) (secondary) poly(3-6ethoxyates.	A	P	II	NR	Open	Open	A	.409, .440, .488, .908(a), (b)	NA
Alcohol (O6-C-17) (secondary) poly(7-12-ethoxyates.	B	P	II	NR	Open	Open	A	.409, .440, .488, .908(a), (b)	NA
•Alcohol(C ₁₂ -C ₁₅) poly(1-3ethoxyates, see Alcohol(C₁₂-C₁₅) poly(1-6ethoxyates, see Alcohol(C₁₂-C₁₅) or poly(1-7-19ethoxyates, see Alcohol(C₁₂-C₁₅) poly(1-6ethoxyates									
Alcohol(C ₁₂ -C ₁₅) poly(7-19ethoxyates	A	P	II	NR	Open	Open	A	.409	NA
Alcohol(C ₁₂ -C ₁₅) poly(20+ethoxyates	B	P	II	NR	Open	Open	A	.409	NA
Alkanes(C ₆ -C ₉) (all isomers)	C	P	II	4m	P/V	Restr	A	.409	NA
Alkanes(C ₁₄ -C ₁₇) sulfonic acid, sodium salt solution (65% or less).	C	P	II	NR	Open	Open	NSR	.409, .908(a)	NA
Alkaryl polyether (C ₉ -C ₂₀)	B	P	II	NR	Open	Restr	A, B	.409	NA
Alkyl acrylate-vinyl pyridine copolymer in Toluene.	C	P	II	4m	P/V	Restr	A	.409	NA
Alkyl(C ₃ -C ₄)benzenes (all isomers)	A	P	II	NR	Open	Open	A	.409	I-D
Alkyl(C ₅ -C ₈)benzenes (all isomers)	A	P	II	NR	Open	Open	A	.409	I-D
•Alkylibenzene, Alkyllindane, Alkyllindane mixture (each C ₁₂ -C ₁₇).	A	P	II	NR	Open	Open	A	.409	NA
Alkylibenzenesulfonic acid (greater than 4%).	C	Sup	II	NR	Open	Open	NSR	.440, .903, .908(a), (b)	NA
Alkylibenzenesulfonic acid, sodium salt solution.	C	P	II	NR	Open	Open	NSR	.440, .903, .908(a), (b)	NA

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Alkyl(C7–C9) nitrates.....	A	S/P P	NR NR	Open Open	A, B A	409, 560, 1002	NA
Alkyl (C7-C12) phenol poly(4-12)	B	S/P S/P	B/3 B/3	PV PV	Closed Closed	316, 408, 525, 526, 527, 933, 1020	I-D
ethoxylate.			4m	PV	Restr NSR	.316, 408, 525, 526, 527, 1020	I-C
Allyl alcohol	B	S/P S	NR	Open	A, C, D A	.252, .526, 527, 554, 557, 933, 1045, 1052	I-D
Allyl chloride	B	S/P S	NR	Open	A, C, D A	.236(b), (c), 409	I-B
Aluminum chloride (30% or less). Hydro-chloric acid (20% or less) solution.	D	S	NR	Open	A, C, D A	.236(a), (b), (c), (g)	NA
2-(2-Aminoethoxy) ethanol	D	S	NR	Open	A, C, D A	.236(b), (c), 409, 526	I-C
Aminoethyl ethanolamine	D	S	NR	Open	A, C, D A	.236(a), (b), (c), (g)	I-D
N-Aminoethyl(piperazine)	D	S	NR	Open	A, C, D A	.236(a), (b), (c), (g)	NA
2-Amino-2-methyl-1-propanol (90% or less).	D	S	NR	Open	A, C, D A	.236(a), (b), (c), (g)	NA
Ammonia aqueous (28% or less), see Ammonium hydroxide (28% or less NH ₃).							
Ammonium bisulfite solution (70% or less).	D	S	4m	PV	Restr NSR	No	NA
Ammonium hydroxide (28% or less NH ₃)	C	S/P S	4m	PV	Restr Open	236(e), .933, 1002	I-D
Ammonium nitrate solution (greater than 45% and less than 93%).	D	S	NR	Open	A, B, C NSR	.236(b), (c), (f), .526, 527	NA
•Ammonium sulfide solution (45% or less).	C	S/P P	B/3	PV	Closed A, C	.236(d), .252, .336, .409, .554(a), (b)	NA
Ammonium thiocyanate (25% or less), Ammonium thiosulfate (20% or less) solution.	C	P	NR	Open	Open NSR	236(a), (b), (c), (g), .316, .408, .525, .526, .527, .933, .1002, .1020. None	I-D
Ammonium thiosulfate solution (60% or less). •commercial, iso-, n-, sec-) Amyl acetate, see Amyl acetate (all isomers).	C	P	III	NR	Open NSR	.440, .908(b)	NA
Amyl acetate (all isomers).....	C	S/P S	4m	PV	Restr Closed	.409	I-D
Aniline	C	P	III	PV	Restr B	.316, .408, .525, .526, .933, 1020	I-D
Anthracene oil (Coal tar fraction), see Coal tar.	[B]	P	4m	PV	Restr B	.409	I-C
Aviation alkylates (C8 paraffins and iso-paraffins, b. pt. 95–120 deg. C), Barium long chain alkaryl sulfonate (C11–C50).	C	P	NR	Open	Open A	.409; (.440, .903, .908(a)) ¹	NA
Barium long chain alkyl (C8–C14) phenate sulfide.	[A]	P	NR	Open	Open A	.409	NA
Benzene hydrocarbon mixtures ² (having 10% Benzene or more).	C ²	S/P S	B/3	PV	Closed A,B	.316, .409, .440, .526, .908(b), .933, .1060	I-D
Benzensulfonyl chloride	D	S	4m	PV	Restr Closed	A, B, D B	.236(a), (b), (c), (g), .409, .526
Benzene, Toluene, Xylene mixtures ² (having 10% Benzene or more).	@C ²	S/P S	B/3	PV	Restr NSR	.316, .409, .440, .526, .908(b), .1060	I-D
Benzyl acetate	C	P	NR	Open	Open A	None	I-D
Benzyl alcohol	C	P	NR	Open	Open A	None	I-D
Benzyl chloride	B	S	B/3	PV	Closed Resir Open	.316, .408, .525, .526, .927, .912(a)(2), .1004, .1020	I-D
Bromoformomethane	D	P	4m	NR	Open	None	NA
Butene oligomer409	NA

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TABLE 1.—SUMMARY OF MINIMUM REQUIREMENTS—Continued

Cargo name	IMO Annex II pollution category	Haz.	Cargo containment system	Ventheight	Vent	Gauge	Fire protection system	Special requirements in 46 CFR Part 153	Electrical hazard class and group
a.	b.	c.	d.	e.	f.	g.	h.	i.	j.
(iso- n-) Butyl acetate, see Butyl acetate (all isomers) , Butyl acetate (all isomers).....	C	P	III	4m	F/V	Restr	A	.409	I-D
(iso- n-) Butyl acrylate, see Butyl acrylate (all isomers) , Butyl acrylate (all isomers).....	B	S/P S/P P P	II II III II	4m B/3 4m NR	F/V F/V F/V Open	Restr Restr Restr Open	A A A A	.409, .526, .912(a)(1), .1002(a), (b), .1004, .236(b), (c), .316, .408, .525, .526, .527, .1020	I-D
Butylamine (all isomers).....	C	A	III	4m	F/V	Restr	A	.409	I-D
Butylbenzene (all isomers).....	A	A	III	4m	F/V	Restr	A	.409	I-D
Butyl benzyl phthalate	A	A	III	4m	F/V	Restr	A	.409	I-D
n-Butyl butyrate, see Butyl butyrate (all isomers) , Butyl butyrate (all isomers).....	B	P	III	4m	F/V	Restr	A, C	.409, .409, .440, .500, .526, .530(a), (c), (e)–(g), (m)–(o), .1010, .1011.	I-B
1,2-Butylene oxide	C	S/P [C]	II P	4m B/3 NR	F/V F/V Open	Restr Restr Open	A, D A	.409, .500, .525, .526, .1020	I-C NA
n-Butyl ether	C	P	III	4m	F/V	Restr	A, D, C, D	.409, .409, .526, .912(a)(1), .1002(a), (b), .1004, .912(a)(1), .1002(a), (b), .1004	I-D
iso-Butyl isobutyrate, see Butyl isobutyrate (all isomers) , Butyl isobutyrate, see Butyl butyrate (all isomers) , Butyl methacrylate	D	S	III	4m	F/V	Restr	A, D, C, D	.409, .409, .526, .912(a)(1), .1002(a), (b), .1004, .912(a)(1), .1002(a), (b), .1004	I-D
Cetyl-Eicosyl methacrylate mixture.	D	S	III	4m	F/V	Restr	A, D, C, D	.409, .409, .526, .912(a)(1), .1002(a), (b), .1004, .912(a)(1), .1002(a), (b), .1004	I-D
n-Butyl propionate	C	P	III	4m	F/V	Restr	A	.409, .409	I-D
Butyl toluene	@A	P	II	NR	Open	Open	A	.409, .409	I-D
•iso-Butyraldehyde, see Butyraldehyde (all isomers) , •n-Butyraldehyde, see Butyraldehyde (all isomers) , Butyraldehyde (all isomers)	C	S/P S P	III II II	4m 4m NR	F/V F/V Open	Restr Restr Open	A A A	.409, .409, .526, .238(a), .554, .409	I-C I-D NA
Butyric acid	D	A	III	4m	F/V	Restr	A	.409, .409	I-C
Calcium alkyl phenol sulfide, polyolefin phosphorusulfide mixture, •Calcium alkyl salicylate, see Calcium long chain alkyl salicylate (C13+) , •Calcium bromide, Zinc bromide solution, see Drilling brine (containing Zinc salts). Calcium hypochlorite solution (15% or less). Calcium hypochlorite solution (more than 15%).	C	S/P S/P	III III	4m 4m	F/V F/V	Restr Restr	NSR NSR	.236(a), (b), .236(a), (b), .409	NA NA

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Calcium	long chain alkyl salicylate (C13+).	C	P	NR	Open	A, B	(.440, .903, .908(a)) ¹	NA
Camphor oil		B	S/P	.4m	PV	A, B	.409	I-D
Carbolic oil		A	S/P	B/3	PV	A	.408, .440, .525, .526, .908(b), .933, .1020	NA
Carbon disulfide		B	S/P	B/3	PV	C	.236(c), .252, .408, .500, .515, .520, .525, .526, .527,	I-A
Carbon tetrachloride		B	S/P	B/3	PV	Closed	.1020, .1040,	
Cashew nut shell oil (untreated)		D	S	4m	PV	Closed	.316, .409, .525, .526, .527, .1020	
•Caustic polish solution		D	S	4m	PV	NSR	.526, .933	
Caustic soda solution		D	S	NR	Open	A, B	.236(a), (c), (g), .933	
Cetyl/Eicosyl methacrylate mixture		D	S	NR	Open	NSR	.236(a), (c), (g), .933	
Chlorinated paraffins (C10-C13)		A	P	—	NR	Open	.912(a)(1), .1002(a), (b), .1004	
Chloroacetic acid (80% or less)		C	S/P	B/3	PV	A, C, D	.408	
•Chlorobenzene		B	S/P	4m	PV	Open	.238(e), .408, .440, .554, .908(b)	I-D
Chloroform		B	S/P	B/3	PV	NSR	.409, .526	I-D
(crude) Chlorhydrins		D	S	B/3	PV	NSR	.409, .525, .526, .527, .1020	NA
•4-Chloro-2-methylphenoxoacetic acid, dimethylamine salt solution.		C	P	NR	Open	Closed	.408, .525, .526, .1020	I-D
•o-Chlorotribenzeno		B	S/P	B/3	PV	NSR	.236(a), (b), (c), (g)	NA
2- or 3-Chloropropionic acid		C	S/P	NR	Open	Closed	.316, .336, .408, .440, .525, .526, .908(a), (b), .933,	NA
Chlorosulfonic acid		C	S/P	B/3	PV	NSR	.1020, .238(a), (b), .440, .554, .908(a), (b)	NA
o-Chirotoluene		A	S/P	4m	PV	Open	.408, .525, .526, .527, .554, .555, .602, .933, .1000,	I-B
m-Chirotoluene		B	S/P	4m	PV	Closed	.1020, .1045,	
p-Chirotoluene		B	S/P	4m	PV	NSR	.409, .526	I-D
Chirotoluenes (mixed isomers)		A	S/P	4m	PV	Restr	A, B, C	I-D
Coal tar		A	S/P	4m	PV	Restr	A, B, C	I-D
Coal tar naphtha solvent		B	S/P	4m	PV	Restr	A, B, C	I-D
Coal tar pitch (molten)		D	S	4m	PV	Restr	A, D	I-D
Cobalt naphthenate in solvent naphtha		A	S/P	4m	PV	Restr	B, D	I-D
Coconut oil, fatty acid		C	P	NR	Open	Restr	A, D	I-D
Cottonseed oil, fatty acid		[C]	P	NR	Open	Open	.409, .526, .933, .1060	
Creosote (coal tar)		A	S/P	NR	Open	Restr	B, D	I-D
Creosote (wood)		A	S/P	NR	Open	Restr	A, D	I-D
Creosols (all isomers)		A	S/P	NR	Open	Restr	A, D	I-D
Creosols with less than 5% Phenol, see Cresols (all isomers)						Restr	A, B	I-D
Cresols with 5% or more Phenol, see Phenol						Restr	A, B	I-D
Cresylate spent caustic (mixtures of Cresols and Caustic soda solutions).		A	S/P	NR	Open	NSR	.236(a), (c), .409, .933	NA
Cresylate spent caustic (mixtures of Cresols and Caustic soda solutions).		A	S/P	NR	Open	A, B	.409	NA
Cresylic acid, dephenolized						Restr	A	I-C
Cresylic acid, sodium salt solution, see Cresylate spent caustic.						Restr	A	
Crotonaldehyde						Restr	A	
Cumene (isopropylbenzene), see Propylbenzene (all isomers).						Restr	A	
•1,5,9-Cyclododecatriene		A	S/P	4m	PV	Restr	.236(b), (c), .408, .526, .912(a)(1), .1002(a), (b), .1004	I-D
Cycloheptane		C	II	4m	PV	Restr	.409	I-D

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TABLE 1.—SUMMARY OF MINIMUM REQUIREMENTS—Continued

Cargo name	IMO Annex II pollution category	Haz.	Cargo containment system	Ventheight	Vent	Gauge	Fire protection system	Special requirements in 46 CFR Part 153	Electrical hazard class and group
a.	b.	c.	d.	e.	f.	g.	h.	i.	j.
Cyclohexane	C	P	III	4m	PV	Restr	A	409, 440, 908(b), 236(a), (b), 409, 526	I-D
Cyclohexanone, Cyclohexanol mixture	D	S	III	4m	PV	Restr	A	236(a), (b), 526	I-D
Cyclohexyl acetate	B	P	III	4m	PV	Restr	A, C, D	409, 440, 908(a), (b)	I-D
Cyclohexylamine	C	SP	III	4m	PV	Restr	A	409, 440, 908(a), (b)	I-C
1,3-Cyclopentadiene dimer (molten)	B	P	III	4m	PV	Restr	A	409, 440, 908(a), (b)	I-D
Cyclopentane	C	P	III	4m	PV	Restr	A	409, 440, 908(a), (b)	I-D
Cyclopentene	B	P	III	4m	PV	Restr	A	409, 440, 908(a), (b)	I-D
p-Cymene	C	P	III	4m	NR	Open	A	None	I-C
Iso-Decaldehyde	@C	P	III	NR	Open	Open	A	None	I-C
n-Decaldehyde	@B	P	III	NR	Open	Open	A	440, 903, 908(a), (b)	NA
Decanoic acid	C	P	III	4m	PV	Restr	A	409, 440, 908(a), (b)	I-D
Decene	B	P	III	NR	NR	Open	A	409, 440, 908(a), (b)	I-D
Decyl acetate	B	SP	III	NR	NR	Open	A, C, D	236(a), (b), (c), (d), 409, 912(a)(1), 1002(a), (b), 1004	NA
(iso-, n-) Decyl acrylate	A	P	III	NR	NR	Open	A	409, 440, 908(b), 526	I-D
Decyl alcohol (all isomers)	A	SP	III	B/3	PV	Restr	A	236 (a), (b), (d), 408, 525 (a), (c), (d), (e), 526, No	NA
Dicycloxyethoxyhydro-thiophene dioxide	C	SP	II	4m	PV	Restr	A, B, C, D	933, 1020, 236(b), (c), 409, 526	I-C
Dibromomethane	C	SP	III	4m	PV	Open	A	409, 440, 908(a), (b)	NA
Dibutylamine	B	P	III	NR	Open	Open	A	409, 440, 908(a), (b)	NA
Diethyl hydrogen phosphonate	A	P	II	NR	Open	Restr	A, B, D	236(a), (b), (c), (d), (e), 526, 908(a), (b)	I-D
•ortho-Diethyl phthalate	B	SP	II	4m	PV	Closed	A, B, C	316, 409, 525 (a), (c), (d), (e), 526, 527, 933, 1020,	I-D
•Dichlorobenzene (all isomers) ¹	B	SP	III	B/3	PV	Restr	A, B, C	409, 526, 527	I-C
3,4-Dichloro-1-butene	B	S	III	4m	PV	Restr	A, B, C	236(a), (b), 409, 526	NA
D	S	II	4m	PV	Restr	A, B, C	236(a), (b), 316, 408(a), 440, 525, 526, 1020	I-D	
•1,1-Dichloroethane	B	SP	II	4m	PV	Restr	A, B, C	526	I-D
2,2'-Dichloroethyl ether	B	SP	II	4m	PV	Restr	A, B, C	236(a), (b), 409, 526	I-C
1,6-Dichlorohexane	B	SP	II	4m	PV	Restr	A, B, C	409, 526	NA
2,2'-Dichloroisopropyl ether	C	SP	II	B/3	PV	Restr	A, B, C	236(a), (b), 316, 408(a), 440, 525, 526, 1020	I-D
Dichloromethane	D	S	III	4m	PV	Restr	A, B, C	526	I-D
2,4-Dichlorophenol [#]	A	SP	II	4m	PV	Restr	A, B, C	236(a), (b), (c), (d), 409, 440, 500, 501, 526, 908(b), 933,	I-D
2,4-Dichlorophenoxyacetic acid, diethanolamine salt solution	A	SP	III	NR	Open	Open	NSR	236(a), (b), (c), (d), 409	NA
2,4-Dichlorophenoxyacetic acid, dimethylene salt solution	A	SP	III	NR	Open	Open	NSR	236(a), (b), (c), (d), 409	NA
2,4-Dichlorophenolamine salt solution	A	SP	III	NR	Open	Open	NSR	236(a), (b), (c), (d), 409	NA

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TABLE 1.—SUMMARY OF MINIMUM REQUIREMENTS—Continued

Cargo name	IMO Annex II pollution category	Haz.	Cargo containment system	Ventheight	Vent	Gauge	Fire protection system	Special requirements in 46 CFR Part 153	Electrical hazard class and group
a.	b.	c.	d.	e.	f.	g.	h.	i.	j.
Dimethylsuccinic acid	C	P	III	NR	Open	A	440, .903(b) .....	.....	I-D
Dimethyl phthalate	C	P	III	NR	Open	A	440, .908(b) .....	.....	I-D
Dimethyl succinate	C	S	III	NR	Open	A	316, 408, 525, 527, 1003, 1020, .....	.....	NA
Dinitrotoluene (moltien)	A	D	S	B/3	FV	A	316, 408, 525, 527, 1003, 1020, .....	.....	I-C
1,4-Dioxane	D	S	III	B/3	FV	A	409, 525, 526, 1020 .....	.....	I-C
Dipentene	C	P	III	4m	FV	A	409 .....	.....	I-D
Diphenyl	A	P	-	NR	Open	B	408 .....	.....	I-D
Diphenylamines, alkylated	A	P	II	NR	Open	A	408 .....	.....	NA
Diphenylamine, reaction product with 2,2,4-Trimethylpentene, Diphenyl, Diphenyl ether mixtures	A	P	-	NR	Open	A	408 .....	.....	NA
Diphenyl ether	A	P	III	NR	Open	B	408 .....	.....	I-D
Diphenyl ether, Biphenyl phenyl ether mixture. Diphenylmethane diisocyanate ⁶	A	P	III	NR	Open	A, B	409 .....	.....	NA
Diphenyl propane-epichlorohydrin resins. Di-n-propylamine	B	S/P	II	B/3	FV	Closed	A, B, C ⁶ , .236(a), (b), .316, .409, .440, .500, .501, .525, .526, .....	.....	NA
Dodecanol	B	P	III	NR	Open	A, B	.602, .908(a), .1000, .1020, .....	.....	NA
Dodecene (all isomers)	C	S/P	III	4m	FV	Restr	A, .236(b), (c), .409, .525, .526, .1020 .....	.....	I-C
Dodecylic alcohol, see Dodecanol	B	P	III	NR	Open	A	.409, .440, .488, .908(a), (b) .....	.....	I-D
•Dodecylamine, Tetradecylamine mixture. Dodecyldimethylamine, Tetradecyl-dimethylamine mixture. Dodecyl diphenyl ether disulfonate solution. Dodecyl hydroxypropyl sulfide	A	S/P	II	4m	FV	Restr	A, D, .236(b), (c), .409, .526 .....	.....	NA
Dodecyl-Pentaadecyl methacrylate mixture.	A	S/P	II	NR	Open	B, C, D	.236(b), .409 .....	.....	NA
Dodecyl phenol	A	S/P	II	NR	Open	NSR	409 .....	.....	NA
•Drilling brine (containing Zinc salts)	[A]	P	II	NR	Open	A	.409 .....	.....	NA
Dodecyl methacrylate	B	S	III	NR	Open	A, C	.236(b), (c), .912(a)(1), .1004 .....	.....	I-D
Dodecyl-Pentaadecyl methacrylate mixture.	A	S/P	II	NR	Open	A, C, D	.912(a)(1), .1002(a), (b), .1004 .....	.....	NA
Ethanolamine	D	S	III	NR	Open	A	408 .....	.....	I-D
2-Ethoxyethyl acetate	C	P	III	4m	FV	A	.409 .....	.....	NA
Ethyl acrylate	A	S/P	II	4m	FV	A	.409 .....	.....	I-C
Ethylenamine	C	S/P	II	B/3	FV	Closed	C, D	.409, .526, .527, .912(a)(1), .1002(a), (b), .1004	I-D
Ethylenamine solution (72% or less)	C	S/P	II	B/3	FV	Closed	A, C	.236(a), (b), (c), (g), .372, .408, .525(a), (c), (d), (e), .526, .527, .1020,	I-D

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TABLE 1.—SUMMARY OF MINIMUM REQUIREMENTS—Continued

Cargo name	IMO Annex II pollution category	Haz.	Cargo containment system	Ventheight	Vent	Gauge	Fire protection system	Special requirements in 46 CFR Part 153	Electrical hazard class and group
a.	b.	c.	d.	e.	f.	g.	h.	i.	j.
Fumaric adduct of rosin, water dispersion.	B	P	III	NR	Open	NSR	.409, .440, .908(a)	NA	
Furfural	C	S/P	III	4m	PV	Restr A	.409, .526	I-C	
Furfuryl alcohol	C	P	III	NR	Open	A	None	I-C	
Glycidyl ester solution (50% or less)	D	S	III	NR	Open	NSR	None	NA	
Glycidyl ester of C10 Trialkyl acetic acid, see Glycidyl ester of Tridecyl acetic acid.									
Glycidyl ester of Tridecyl acetic acid	B	P	III	NR	Open	A	.409	NA	
Heptane (all isomers)	C	P	III	4m	PV	Restr A	.409	I-D	
Heptanol (all isomers)	C	P	III	4m	PV	Restr A	.409	I-D	
Heptene (all isomers)	C	P	III	4m	PV	Restr A	.409	I-D	
Heptyl acetate									
Hexamethylene diamine solution	B	S/P	III	NR	Open	A	.236(b), (C), .409, .440, .526, .908(b)	NA	
Hexamethylenamine	C	S/P	III	4m	PV	Restr A, C	.236(a), (B), (C), (G), .409, .526	I-C	
Hexane (all isomers)	C	P	III	4m	PV	Restr A	.409	I-D	
Hexene (all isomers)	C	P	III	4m	PV	Restr A	.409	I-D	
Hexyl acetate	B	P	III	4m	PV	Restr A	.252, .526, .527, .554, .557, .933, .1045, .1052	I-B	
Hydrochloric acid	D	S	III	4m	PV	NSR	.238(a), (C), .355, .409, .440(a) (1&2), .500, .933, .1004(a)(2), .1500,	NA	
Hydrogen peroxide solutions (over 8% but not over 60%).	C	S/P	II	B/3	PV	Closed	.238(a), (C), .355, .409, .440(a) (1&2), .500, .933, .1004(a)(2), .1500,	NA	
Hydrogen peroxide solutions (over 60% but not over 70%).	C	S/P	II	B/3	PV	Closed	.408, .525, .526, .912(a)(1), .933, .1002(a), (B), .1004, .1020,	NA	
2-Hydroxyethyl acrylate	B	S/P	III	NR	Open	A	.440, .903, .908(a)	NA	
C	P	III	NR	Open	A	.409, .440, .908(a)	NA		
B	P	III	4m	PV	Restr A	.236(b), (C), .526	NA		
D	S	III	B/3	PV	Closed	A, B, C ⁶ , D	.236(a), (B), .316, .409, .500, .501, .525 , .526, .602, .1000, .1020,	NA	
Isophorone diisocyanate ⁶	B	S/P	III	4m	PV	Restr B	.372, .409 , .440, .912(a)(1), .1002(a), (B), .1004	I-D	
Isoprene	C	S/P	III						
Isopropylbenzene (Cumene), see Propylbenzene (all isomers)									
Lactonitrile solution (80% or less)	B	S/P	II	B/3	PV	Closed	A, C, D	.238(d), .252, .316, .336, .408, .440, .525, .526, .527, .908(a), .912(a)(2), .1002, .1004, .1020, .1035, .409 , .440, .488, .908(a), (B)	I-D
Lauric acid	B	P	III	NR	Open	A	.409, .440, .488, .908(a), (B)	NA	
Lauryl polyglucoside (50% or less)	[B]	P	III	NR	Open	No	(.440, .903, .908(a)) ¹	NA	
Long chain alkyl polyether (C11-C20) Long chain polyetheramine in alkyl(C2-C4)benzenes.	C	P	III	NR	Open	A, B	.409, .440, .903, .908(a)	NA	

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Magnesium long chain alkyl salicylate (C11+).	C	P	NR	Open	A, B	(.440, .903, .908(a)) ¹	NA
Maleic anhydride ⁷	D	S	4m	PV	None	I-D
Mercaptobenzothiazol, sodium salt solution, see Sodium-2-mercaptopbenzothiazol solution	D	S	III	4m	PV	.....	I-D
Mesityl oxide	D	S ^P	II	NR	Resir	A	236(b), (c), .409, .526
Methyl sodium solution	A	S	II	NR	Open	NSR	236(a), (b), (c), (g), .409
Methacrylic acid	D	S ^P	II	4m	PV	Resir	.238(a), .526, .912(a)(1), .1004
Methacrylic resin in Ethylene dichloride ..	B	S	II	4m	PV	Resir	.236(b), .408, .440, .526, .908(a)
•Methacrylonitrile	D	S	II	B/3	PV	Closed	.236(b), .316, .408, .525, .526, .527, .912(a)(1), .1002(a), .1004, .1020.
N-(2-Methoxy-1-methyl ethyl)-2-ethyl-6-methyl chloroacetanilide, see <i>Metolachlor</i>	B	S ^P	II	4m	PV	Resir	A, B
Methyl acrylate	S ^P	II	II	B/3	PV	Closed	A, C, D
Methylamine solution (42% or less)	C	P	II	4m	PV	Resir	A
Methylamyl acetate	C	P	II	4m	PV	Resir	A
•Methylamyl alcohol	C	P	II	4m	PV	Resir	A
Methyl butyrate	C	P	II	4m	PV	Resir	A
Methylcyclohexane	C	P	II	4m	PV	Resir	A
Methylcyclopentadiene dimer	B	S	II	4m	PV	Resir	B
•Methyl diethanolamine	D	S	II	NR	Open	Open	A
Methylene chloride, see <i>Dichloromethane</i>	C	S ^P	II	NR	Open	A, B, C,	None
2-Methyl-6-ethylaniline	B	S ^P	II	NR	Open	D	.....
2-Methyl-5-ethylpyridine	D	S	II	NR	Open	A, D	236(b), .409
Methyl formate	D	S	II	B/3	PV	Resir	A
Methyl hept-1-ene	B	P	II	4m	PV	Resir	A
2-Methyl-2-hydroxy-3-butene	II	S	II	4m	PV	Resir	A, B, C,
Methyl methacrylate	D	S	II	4m	PV	D	372, .408, .440, .526, .527, .1020
Methyl naphthalene (molten)	A	S ^P	II	4m	PV	Resir	A, B
•2-Methyl-1-Pentene, see <i>Hexene (all isomers)</i> .			II	B/3	PV	Closed	A, C
•4-Methyl-1-pentene, see <i>Hexene (all isomers)</i> .			II	B/3	PV	Closed	A, C
•2-Methylpyridine	D	S	II	NR	Open	A, C, D	236(b), .408, .525(a), (c), (d), (e), .1020
•3-Methylpyridine	C	S ^P	II	4m	PV	Open	236(b), .408, .525(a), (c), (d), (e), .526, .908(e), .1020.
•4-Methylpyridine	D	S	II	NR	Open	A, D	.....
Methyl salicylate	B	P	II	4m	PV	Open	A, D
•alpha-Methylstyrene	A	S ^P	II	NR	Open	Open	409, .526, .912(a)(1), .1002(a), (b), .1004
Metolachor	B	P	II	4m	PV	Resir	A, A
Morpholine	D	S	I	B/3	PV	Closed	236(b), (c), .409
Motor fuel anti-knock compounds (containing lead alkyls).	A	S ^P	II	4m	PV	Resir	A, B, C
Naphthalene (molten)			II				.252, .316, .336, .408, .525, .526, .527, .933, .1020, .1025, .409, .440, .908(b)

TABLE 1.—SUMMARY OF MINIMUM REQUIREMENTS—Continued

Cargo name	IMO Annex II pollution category	Haz.	Cargo containment system	Vent/height	Vent	Gauge	Fire protection system	Special requirements in 46 CFR Part 153	Electrical hazard class and group
a.	b.	c.	d.	e.	f.	g.	h.	i.	j.
Naphthalene sulfonic acid, sodium salt solution (40% or less).	[A]	P	III	NR	Open	NSR	.409	.....	NA
Naphthenic acid	A	P	II	NR	Open	A	.409	.....	NA
Naphthenic acid, sodium salt solution	[A]	P	II	NR	Open	NSR	.409	.....	NA
Neodecanoic acid	C	P	III	NR	Open	A	None	.....	NA
Nitration acid (<i>mixture of sulfuric and nitric acids</i>).	C	S/P	II	B/3	P/V	Closed	NSR	.316, .408, .526, .527, .534, .555, .556, .559, .602, .933, .1000, .1045,	I-B
Nitric acid (70% or less)	C	S/P	II	4m	P/V	Restr	NSR	.408, .526, .527, .534, .555, .559, .933, .1045, .316, .336, .408, .440, .525, .526, .908(b), .933, .1020	I-B
Nitrobenzene, see o-Chloronitrobenzene.	B	S/P	II	B/3	P/V	Closed	A, D	.409, .440, .525, .526, .908(a), (b), .1020	I-D
Nitroethane ⁷	D	S	III	4m	P/V	Restr	7A,C	.....	I-C
o-Nitrophenol (molten)	B	S/P	II	B/3	P/V	Closed	A, C, D	.....	NA
o- or 2-Nitropropane ⁷	D	S	III	4m	P/V	Restr	7A,C	.....	I-C
Nitropropane (60%), Nitroethane (40%) mixture ⁷ .	D	S	III	4m	P/V	Restr	7A,C	.....	I-C
Nitropropane (20%), Nitroethane (80%) ⁷	D	S	III	4m	P/V	Restr	7A,C	.....	I-C
(o-, p-) Nitrotoluene	B	S/P	II	B/3	P/V	Closed	A, B	.....	I-C
Nonane (all isomers)	C	P	III	4m	P/V	Restr	B, C	.....	I-D
•Nonene (all isomers)	B	P	III	4m	P/V	Restr	A	.....	I-D
Nony acetate	C	P	III	NR	Open	A	.....	.....	I-D
Nony alcohol (all isomers)	C	P	III	NR	Open	A	None	.....	I-D
Nony phenol	A	P	III	NR	Open	A	.....	.....	I-D
Nony phenol poly(4-12)ethoxyates	B	P	III	NR	Open	A	.....	.....	I-D
Noxious liquid, N.F., (1) n.o.s. ("trade name") contains "principal components" ST 1, Cat A.	A	P	I	4m	P/V	Restr	A	.....	NA
Noxious liquid, F., (2) n.o.s. ("trade name") contains "principal components" ST 1, Cat A.	A	P	II	NR	Open	A	.408	.....	NA
Noxious liquid, N.F., (3) n.o.s. ("trade name") contains "principal components" ST 1, Cat A.	A	P	II	NR	Open	A	.409	.....	NA
Noxious liquid, F., (4) n.o.s. ("trade name") contains "principal components" ST 2, Cat A.	A	P	II	4m	P/V	Restr	A	.409	.....
Noxious liquid, N.F., (5) n.o.s. ("trade name") contains "principal components" ST 2, Cat A.	B	P	II	NR	Open	A	.409; (.440, .908) ¹	NA

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•Noxious liquid, N.F., (6) n.o.s. ("trade name" contains "principal components") ST 2, Cat B, mp. equal to or greater than 15 deg. C.	B	P	II	NR	Open	A	.409, .440, .488, .908(b); (.908(a)) ¹	NA
•Noxious liquid, F., (7) n.o.s. ("trade name" contains "principal components") ST 2, Cat B.	B	P	II	4m	PV	Restr	A	.409; (.440, .908) ¹
•Noxious liquid, F., (8) n.o.s. ("trade name" contains "principal components") ST 2, Cat B, mp. equal to or greater than 15 deg. C.	B	P	II	4m	PV	Restr	A	.409, .440, .488, .908(b); (.908(a)) ¹
Noxious liquid, N.F., (9) n.o.s. ("trade name" contains "principal components") ST 3, Cat A.	A	P	III	NR	Open	Open	A	.409
Noxious liquid, F., (10) n.o.s. ("trade name" contains "principal components") ST 3, Cat B, mp. equal to or greater than 15 deg. C.	A	P	III	4m	PV	Restr	A	.409
Noxious liquid, N.F., (11) n.o.s. ("trade name" contains "principal components") ST 3, Cat B.	B	P	III	NR	Open	Open	A	(.409, .440, .908) ¹
Noxious liquid, N.F., (12) n.o.s. ("trade name" contains "principal components") ST 3, Cat A.	B	P	III	NR	Open	Open	A	.409, .440, .488, .908(b); (.908(a)) ¹
Noxious liquid, N.F., (13) n.o.s. ("trade name" contains "principal components") ST 3, Cat B.	B	P	III	4m	PV	Restr	A	.409; (.440, .908) ¹
Noxious liquid, F., (14) n.o.s. ("trade name" contains "principal components") ST 3, Cat B, mp. equal to or greater than 15 deg. C.	B	P	III	4m	PV	Restr	A	.409, .440, .488, .908(b); (.908(a)) ¹
Noxious liquid, F., (15) n.o.s. ("trade name" contains "principal components") ST 3, Cat C.	C	P	III	NR	Open	Open	A	(.440, .903, .908) ¹
Noxious liquid, F., (16) n.o.s. ("trade name" contains "principal components") ST 3, Cat C.	C	P	III	4m	PV	Restr	A	(.440, .903, .908) ¹
Octane (all isomers)	C	P	III	4m	PV	Restr	A	.409
Octano (all isomers)	C	P	III	NR	Open	Open	A	None
Octene (all isomers)	B	P	III	4m	PV	Restr	A	409
Octyl acetate	C	P	III	NR	Open	Open	A	None
Octyl aldehydes	B	P	III	4m	PV	Restr	A	409
Octyl nitrates (all isomers), see Alkyl(C7-C9) nitrates.								-C
Olefin mixtures (C5-C7)	C	P	III	4m	PV	Restr	A	.409
Olefin mixtures (C5-C15)	B	P	III	4m	PV	Restr	A	.409
alpha-Olefins (C6-C18) mixtures	B	P	II	B/3	PV	Closed	NSR	-D
Oleum	C	S/P	II	4m	PV	Restr	A	.316, .408, .440, .536, .527, .554, .555, .566, .602, .908(a), .933, .1000, .1045, .1052, .409, .526
Oleyamine								NA

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TABLE 1.—SUMMARY OF MINIMUM REQUIREMENTS—Continued

Cargo name	IMO Annex II pollution category	Haz.	Cargo containment system	Ventheight	Vent	Gauge	Fire protection system	Special requirements in 46 CFR Part 153	Electrical hazard class and group
a.	b.	c.	d.	e.	f.	g.	h.	i.	j.
•Palm kernel acid oil	C	P	III	NR	Open PV	A, B	440, 903, 908(a), (b)	NA	I-C
Paraffinhyde	C	SP	III	4m	Restr PV	A	409, 440, 908(b)	NA	NA
Penachloroethane	B	SP	III	B/3	PV	NSR	.316, .409, .525, .526, .1020	NA	I-D
1,3-Pentadiene	C	SP	III	4m	PV	A, B	409, .526, .912(a)(1), 1002, 1004	I-D	I-D
Pentane (all isomers)	C	P	III	4m	PV	Restr A	.372, .409	I-D	I-D
Pentene (all isomers)	C	P	III	4m	PV	Restr A	.409	I-D	I-D
n-Pentyl propionate	C	SP	III	4m	PV	Restr NSR	.409	NA	NA
Perchloroethylene	B	SP	III	B/3	PV	NSR	.409, .526	NA	I-D
•Phenol (or solutions with 5% or more Phenol)	C	P	III	NR	Open PV	A, B	None	NA	I-B
1-Phenyl-1-ethyl ethane	D	S	III	NR	Open PV	NSR	.554, .555, .558, .1045, .1052	NA	I-D
Phosphoric acid	C	SP	III	4m	Restr A, D	A, D	.440, .908(a), (b)	NA	I-D
Phthalic anhydride (molten)	A	P	III	4m	PV	Restr A	.409	I-D	I-D
Pinene, see the alpha- or beta- isomers.	B	P	III	4m	PV	Restr A	.409	I-D	I-D
alpha-Pinene	C	P	III	NR	Open PV	A	.440, .908(a)	NA	I-D
beta-Pinene	C	P	III	4m	PV	Restr A	.409, .440, .903, .908(a)	NA	NA
•Pine oil	C	P	III	NR	Open PV	Open A	.440, .903, .908(a)	NA	I-D
•Polyalkyl(C18-C22) acrylate in Xylene	C	P	III	4m	NR	Open PV	.409	NA	I-D
Polyalkylene oxide polyol	A	P	III	4m	NR	Open PV	.409	NA	I-D
Poly(2,2'-cyclic aromatics)	C	SP	III	NR	Open PV	Open A	.236(b), (c), .400, .440, .908(b)	NA	I-D
Polyethylene polyamines	C	SP	III	NR	Open PV	Open A	.238(d)	NA	I-D
Polyferric sulfate solution	D	S	II	B/3	Restr A, C ⁶ , D	Open PV	.236(a), (b), .409, .500, .501, .525, .526, .602, 1000, .1020, .409, .440, .903, .908(a)	NA	I-D
Polymerized polyphenyl isocyanate ⁶	C	P	III	4m	PV	Restr A	(.440, .903, .908(a)) ¹	NA	I-D
Polyolefaminamine in alkyl(C2-C4)benzenes.	C	P	III	NR	Open PV	A, B	.....	NA	NA
Polyolefin phosphorusulfide, barium derivative (C28-C250).	C	P	III	NR	Open PV	Open A	.....	NA	NA
Potassium hydroxide solution, see Caus-tic potash solution	[C]	SP	III	NR	Open PV	No	.....	NA	NA
Potassium oleate	[B]	SP	III	4m	PV	Restr A, B	.....	NA	NA
Potassium polysulfide, Potassium thiosulfate solution (41% or less).	C	SP	III	NR	Open PV	Open A, D	.....	I-D	I-D
Propanil, Methyl oxide, Isophrone mixture.	C	SP	III	4m	Open PV	Open PV	.....	I-C	I-C
iso-Propanolamine	C	SP	III	4m	Open PV	Restr A	.....	I-D	I-D
n-Propanolamine	C	S	III	4m	Open PV	Restr A	.....	NA	NA
Propionaldehyde	D	SP	III	4m	Open PV	Restr A	NA	NA
Propionic acid	C	SP	III	NA	NA
Propionic anhydride	NA	NA

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TABLE 1.—SUMMARY OF MINIMUM REQUIREMENTS—Continued

Cargo name	IMO Annex II pollution category	Haz.	Cargo containment system	Ventheight	Vent	Gauge	Fire protection system	Special requirements in 46 CFR Part 153	Electrical hazard class and group
a.	b.	c.	d.	e.	f.	g.	h.	i.	j.
•Sodium naphthenate solution, see Naphthenic acid, sodium salt solution.	B	S/P S/P P	II	NR	Open	NSR			NA
Sodium nitrite solution	B	S/P C	II	NR	Open	A			NA
Sodium petroleum sulfonate	C	S/P	III	NR	Open	NSR			NA
Sodium silicate solution	C	S/P	III	B/3	Open	NSR			NA
•Sodium sulfide solution (15% or less)	C	P	III	NR	Open	Open			NA
Sodium sulfate solution (25% or less)	C	S	III	NR	Open	A, B			NA
•Sodium tetrates, Sodium succinates solution.	D								
Sodium thiocyanate solution (56% or less).	B	S/P P	II	NR	Open	NSR			NA
Styrene monomer	B	S/P P	II	4m	F/V	Restr	A, B		I-D
Sulfohydrocarbon, long chain (C18+)	B	S	III	NR	Open	Open	A, B		NA
Sulfur (molten)	C	S/P	III	NR	Open	NSR			I-C
Sulfuric acid	C	P	III	NR	Open	NSR			I-B
Tall oil (<i>crude and distilled</i>)	B	S/P S/P	II	NR	Open	Open			NA
Tall oil, fatty acid (<i>resin acids less than 20%</i>).	C	P	III	NR	Open	Open			NA
Tall oil fatty acid, barium salt	B	S/P	III	NR	Open	A			NA
Tall oil soap (<i>disproportionated</i>) solution	B	S/P	II	B/3	Open	NSR			NA
1,1,2,2-Tetrachloroethane	D	S	III	NR	Open	Open	A		I-C
Tetraethylpentamine ³	D	S	III	4m	F/V	Restr	A, D		I-C
Tetrahydrodouran	C	P	III	NR	Open	Open	A		I-D
Tetrahydrodiphtalene									
1,2,3,5-Tetramethylbenzene	A	P	II	NR	Open	Restr	A		I-D
see Tetramethylbenzene (all isomers), Toluene	C	P	III	4m	F/V	Closed	A, B, C, D		I-D
Toluenediamine	C	S/P	II	B/3	F/V				NA
Toluene disocyanate ⁶	C	S/P	II	4m	F/V	Closed	A, C ⁸ , D		NA
o-Toluidine	C	S/P	II	B/3	F/V	Closed	A, C		I-D
Tributyl phosphate	B	P	III	NR	Open	Open	A, B, C		I-D
1,2,4-Trichlorobenzene	B	S/P	II	4m	F/V	Restr	A		I-D
•1,1,1-Trichloroethane	C	S/P	III	NR	Open	Open	NSR		I-D
•1,1,2-Trichloroethane	C	S/P	III	B/3	F/V	Restr			I-D
•Trichloroethylene	C	S/P	III						I-D

Coast Guard, DOT

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TABLE 1.—SUMMARY OF MINIMUM REQUIREMENTS—Continued

Cargo name	IMO Annex II pollution category	Haz.	Cargo containment system	Vent/height	Vent	Gauge	Fire protection system	Special requirements in 46 CFR Part 153	Electrical hazard class and group
a.	b.	c.	d.	e.	f.	g.	h.	i.	j.
White spirit (low (15-20%) aromatic)	B	P	II	4m	FV	Restr	A	.409	NA
Xylenes ^a (<i>ortho</i> -, <i>meta</i> -, <i>para</i> -)	C	S/P	III	4m	NR	Restr	A	.409, .440, .908(b) ⁸	I-D
Xylenol	B	P	III	NR	NR	Open	A, B	.409, .440, .908(a) ⁸	NA
Zinc alkaryl dithiophosphate (C7-C16)	C	P	III	NR	NR	Open	A, B	(.440, .903, .908(a)) ¹	NA
Zinc alkyl dithiophosphate (C3-C14)	B	P	III	NR	NR	Open	A, B	.409; (.440, .908(a)) ¹	NA

Items with a bullet (•) or in boldface are changes since October 1, 1993.

Column Heading Footnotes:

a. The cargo name must be as it appears in this column (see 153.900, 153.907). Words in italics are not part of the cargo name but may be used in addition to the cargo name. When one entry references another entry by use of the word "see", and both names are in roman type, either name may be used as the cargo name (e.g., Diethyl ether, see Ethyl ether). However, the referenced entry is preferred.

The provisions contained in 46 CFR part 197, subpart C, apply to liquid cargoes containing 0.5% or more benzene by volume.

b. This column lists the IMO Annex II Pollution Category.

A, B, C, D—NLS Category of Annex II of MARPOL 73/78.

II—Appendix III of Annex II (non-NLS cargoes) of MARPOL 73/78.

#—No determination of NLS status. For shipping on an ocean-going vessel, see 46 CFR 153.900(c).

[]—A NLS category in brackets indicates that the product is provisionally categorized and that further data are necessary to complete the evaluation of its pollution hazards. Until the hazard evaluation is completed, the pollution category assigned is used.
②—The NLS category has been assigned by the U.S. Coast Guard, in absence of one assigned by the IMO. The category is based upon a GE-SAMP Hazard Profile or by analogy to a closely related product having an NLS assigned.

c. This column lists the hazard(s) of the commodity.

S—The commodity is included because of its safety hazards.

P—The commodity is included because of its pollution hazards.

S/P—The commodity is included because of both its safety and pollution hazards.

d. This column lists the type of containment system the cargo must have (see 153.230 through 153.232).

e. This column lists the height of any vent riser required (see 153.350 and 153.351).

f. This column lists any vent control valve required (see 153.355).

g. This column lists the type of gauging system required (see 153.400 through 153.406).

h. This column lists the type of fire protection system required. Where more than one system is listed, any listed system may be used. A dry chemical system may not be substituted for either type of foam system unless the dry chemical system is listed as an alternative or the substitution is approved by Commandant (G-MSO) (see 153.460). The types are as follows:
A is a foam system for water soluble cargoes (polar solvent foam).
B is a foam system for water insoluble cargoes (non-polar solvent foam).
C is a water spray system.
D is a dry chemical system.
NSR means there is no special requirement applying to fire protection systems.

i. This column lists sections that apply to the cargo in addition to the general requirements of this part. The 153 Part number is omitted.

j. This column lists the electrical hazard class and group used for the cargo when determining requirements for electrical equipment under Subchapter J (Electrical Engineering) of this chapter.

A number of electrical hazard class and group assignments are based upon that which appears in "Classification of Gases Liquids and Volatile Solids Relative to Explosion-Proof Electrical Equipment," Publication NMAB 353-5, National Academy Press, 1982, when not appearing in NPA-497M, "Manual for Classification of Gases, Vapors and Dusts for Electrical Equipment in Hazardous (Classified) Locations." The I-B electrical hazard does not apply to weather deck locations (see 46 CFR Part 111) for inorganic acids; Chlorosulfonic acid; Hydrochloric acid; Nitration acid; Nitric acid (70% or less); Oleum; Phosphoric acid; Sulfuric acid.

Abbreviations used in the Table:

NR—No requirement.

NA—Not applicable.

Abbreviations for Noxious Liquid cargoes:

N.F.—non-flammable (flash point greater than 60 deg C (140 deg F) closed cup (cc)).

F.—flammable (flash point less than or equal to 60 deg C (140 deg F) closed cup (cc)).

n.o.s.—not otherwise specified.

ST—Ship type.

Cal—Pollution category.

Footnotes for Specific Cargoes:

1. Special applicability:

153.440 and .908(a) apply to the chemical, and mixtures containing the chemical, with a viscosity of 25 mPa.s at 20 deg C (68 deg F), 153.440 and .908(b) apply to the chemical, and mixtures containing the chemical, with melting point of 0 deg C (32 deg F) and above, 153.448 applies to the chemical, and mixtures containing the chemical, with a melting point of 15 deg C (59 deg F) and above.

2. Benzene containing cargoes.

Applies to mixtures containing no other components with safety hazards and where the pollution category is C or less.

3. Diammonium salt of Zinc ethylenediaminetetraacetic acid solution; Tetraethylpentenamine.

Aluminum is a questionable material of construction with this cargo since pitting and corrosion has been reported. The IMO Chemical Code prohibits aluminum as a material of construction for this cargo.

4. 2,4-Dichlorophenol.

Some tank pitting has been reported when this cargo is contaminated with water, including moisture in the air. The IMO Chemical Code requires that the vapor space over this cargo be kept dry.

5. Reserved.

6. Diphenylmethane diisocyanate; Isophorone diisocyanate; Polymethylene polyphenyl isocyanate; Toluene diisocyanate; Trimethylhexamethylene diisocyanate (2,2,4- and 2,4,4-isomers).
Water is effective in extinguishing open air fires but will generate hazardous quantities of gas if put on the cargo in enclosed spaces.

7. Maleic anhydride; Nitroethane; 1- or 2-Nitropropane; Nitropropane, Nitroethane mixtures.

Dry chemical extinguishers should not be used on fires involving these cargoes since some dry chemicals may react with the cargo and cause an explosion.

8. Xylenes.

Special requirement .908(b) only applies to the para- (p-) isomer, and mixtures containing the para-isomer having a melting point of 0 deg C (32 deg F) or more.

[CGD 92-100, 59 FR 17028, Apr. 11, 1994, as amended by CGD 94-900, 59 FR 45139, Aug. 31, 1994; CGD 94-902, 60 FR 34043, June 29, 1995; CGD 95-900, 60 FR 34050, 34051, June 29, 1995; 60 FR 39267, Aug. 2, 1995]

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TABLE 2—CARGOES NOT REGULATED UNDER SUBCHAPTERS D OR O OF THIS CHAPTER WHEN CARRIED IN BULK ON NON-OCEANGOING BARGES

The cargoes listed in this table are not regulated under subchapter D or O of this title when carried in bulk on non-oceangoing barges. Category A, B, or C noxious liquid substance (NLS) cargo, as defined in §153.2 of this chapter, listed in this table, or any mixture containing one or more of these cargoes, must be carried under this subchapter if carried in bulk on an oceangoing ship. Requirements for Category D NLS cargoes and mixtures of non-NLS cargoes with Category D NLS cargoes are in 33 CFR part 151.

Cargoes	Pollution Category	Cargoes	Pollution Category
2-Amino-2-hydroxymethyl-1,3-propanediol solution.	III	Fructose solution	#
•Ammonium hydrogen phosphate solution	D	Glucose solution	III
Ammonium lignosulfonate solution, <i>see also</i> Lignin liquor.	III	Glycine, sodium salt solution	III
Ammonium nitrate solution (45% or less)	D	•Hexamethylenediamine adipate solution	D
•Ammonium nitrate, Urea solution (2% or less NH ₃), <i>see also</i> Urea, Ammonium nitrate solution (2% or less NH ₃).	D	N-(Hydroxyethyl)ethylenediamine triacetic acid, trisodium salt solution.	D
•Ammonium phosphate, Urea solution, <i>see also</i> Urea, Ammonium phosphate solution.	D	Kaolin clay solution	III
•Ammonium polyphosphate solution	D	Kaolin slurry	III
Ammonium sulfate solution (20% or less)	D	Kraft pulping liquor (free alkali content, 1% or less) <i>including:</i> Black, Green, or White liquor.	#
Apple juice	III	Lignin liquor (free alkali content, 1% or less) <i>including:</i>	#
Calcium bromide solution	III	Ammonium lignosulfonate solution	III
Calcium carbonate slurry	III	Calcium lignosulfonate solution	III
Calcium chloride solution	III	Sodium lignosulfonate solution	III
Calcium hydroxide slurry	D	Magnesium chlorate solution	III
Calcium lignosulfonate solution, <i>see also</i> Lignin liquor.	III	Magnesium hydroxide slurry	III
Calcium nitrate, Magnesium nitrate, Potassium chloride solution.	III	Milk	III
Caramel solutions	III	Molasses	III
Chlorinated paraffins (C14–C17) (with 52% Chlorine),	III	Molasses residue (<i>from fermentation</i>)	[III]
2-Chloro-4-ethylamino-6-isopropylamino-5-triazine solution.	#	Naphthenic acid, sodium salt solution	[A]
Choline chloride solution	D	Noxious liquid, N.F., (1) n.o.s. ("trade name" contains "principle components") ST 1, Cat A (<i>if non-flammable or non-combustible</i>).	A
Clay slurry	III	Noxious liquid, N.F., (3) n.o.s. ("trade name" contains "principle components") ST 2, Cat A (<i>if non-flammable or non-combustible</i>).	A
Coal slurry	III	Noxious liquid, N.F., (5) n.o.s. ("trade name" contains "principle components") ST 2, Cat B (<i>if non-flammable or non-combustible</i>).	B
Dextrose solution	III	Noxious liquid, N.F., (6) n.o.s. ("trade name" contains "principle components") ST 2, Cat B, mp. equal to or greater than 15 deg. C (<i>if non-flammable or non-combustible</i>).	B
Diethylenetriamine pentaacetic acid, pentasodium salt solution.	III	Noxious liquid, N.F., (9) n.o.s. ("trade name" contains "principle components") ST 3, Cat A (<i>if non-flammable or non-combustible</i>).	A
1,4-Dihydro-9,10-dihydroxy anthracene, disodium salt solution.	D	Noxious liquid, N.F., (11) n.o.s. ("trade name" contains "principle components") ST 3, Cat B (<i>if non-flammable or non-combustible</i>).	B
Dodecenylsuccinic acid, dipotassium salt solution.	D	Noxious liquid, N.F., (12) n.o.s. ("trade name" contains "principle components") ST 3, Cat B, mp. equal to or greater than 15 deg. C (<i>if non-flammable or non-combustible</i>).	B
Drilling brine (containing Calcium, Potassium, or Sodium salts) (<i>see also</i> Potassium chloride solution (10% or more)).	B	Noxious liquid, N.F., (15) n.o.s. ("trade name" contains "principle components") ST 3, Cat C (<i>if non-flammable or non-combustible</i>).	C
•Drilling brine (containing Zinc salts)	B	Noxious liquid, n.o.s. (17) ("trade name," contains "principal components"), Category D (<i>if non-flammable or non-combustible</i>).	D
Drilling mud (low toxicity) (<i>if non-flammable and non-combustible</i>).	[III]	Non-noxious liquid, n.o.s. (18) ("trade name," contains "principal components"), Appendix III (<i>if non-flammable or non-combustible</i>).	III
Ethylenediaminetetraacetic acid, tetrasodium salt solution.	D	Pentasodium salt of Diethylenetriamine pentaacetic acid solution, <i>see</i> Diethylenetriamine pentaacetic acid, pentasodium salt solution.	III
Ethylene-Vinyl acetate copolymer (<i>emulsion</i>)	III	Polyaluminum chloride solution	III
Ferric hydroxyethylenediamine triacetic acid, trisodium salt solution.	D	Potassium chloride solution (10% or more)(<i>see also the drilling brines entry</i>).	III
•Fish solubles (<i>water based fish meal extracts</i>)	III	Sewage sludge, treated (<i>treated so as to pose no additional decompositional and fire hazard; stable, non-corrosive, non-toxic, non-flammable</i>).	#
		Sludge, treated (<i>treated so as to pose no additional decompositional and fire hazard; stable, non-corrosive, non-toxic, non-flammable</i>).	#
		Sodium acetate, Glycol, Water mixture (containing 1% or less, Sodium hydroxide) (<i>if non-flammable or non-combustible</i>).	#
		Sodium aluminosilicate slurry	III
		Sodium carbonate solution	D

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Cargoes	Pollution Category
Fructose solution	#
Glucose solution	III
Glycine, sodium salt solution	III
•Hexamethylenediamine adipate solution	D
N-(Hydroxyethyl)ethylenediamine triacetic acid, trisodium salt solution.	D
Kaolin clay solution	III
Kaolin slurry	III
Kraft pulping liquor (free alkali content, 1% or less) <i>including:</i> Black, Green, or White liquor.	#
Lignin liquor (free alkali content, 1% or less) <i>including:</i>	#
Ammonium lignosulfonate solution	III
Calcium lignosulfonate solution	III
Sodium lignosulfonate solution	III
Lignin sulfonic acid, sodium salt solution	III
Magnesium chloride solution	III
Magnesium hydroxide slurry	III
Milk	III
Molasses	III
Molasses residue (<i>from fermentation</i>)	[III]
Naphthenic acid, sodium salt solution	[A]
Noxious liquid, N.F., (1) n.o.s. ("trade name" contains "principle components") ST 1, Cat A (<i>if non-flammable or non-combustible</i>).	A
Noxious liquid, N.F., (3) n.o.s. ("trade name" contains "principle components") ST 2, Cat A (<i>if non-flammable or non-combustible</i>).	A
Noxious liquid, N.F., (5) n.o.s. ("trade name" contains "principle components") ST 2, Cat B (<i>if non-flammable or non-combustible</i>).	B
Noxious liquid, N.F., (6) n.o.s. ("trade name" contains "principle components") ST 2, Cat B, mp. equal to or greater than 15 deg. C (<i>if non-flammable or non-combustible</i>).	B
Noxious liquid, N.F., (9) n.o.s. ("trade name" contains "principle components") ST 3, Cat A (<i>if non-flammable or non-combustible</i>).	A
Noxious liquid, N.F., (11) n.o.s. ("trade name" contains "principle components") ST 3, Cat B (<i>if non-flammable or non-combustible</i>).	B
Noxious liquid, N.F., (12) n.o.s. ("trade name" contains "principle components") ST 3, Cat B, mp. equal to or greater than 15 deg. C (<i>if non-flammable or non-combustible</i>).	B
Noxious liquid, N.F., (15) n.o.s. ("trade name" contains "principle components") ST 3, Cat C (<i>if non-flammable or non-combustible</i>).	C
Noxious liquid, n.o.s. (17) ("trade name," contains "principal components"), Category D (<i>if non-flammable or non-combustible</i>).	D
Non-noxious liquid, n.o.s. (18) ("trade name," contains "principal components"), Appendix III (<i>if non-flammable or non-combustible</i>).	III
Pentasodium salt of Diethylenetriamine pentaacetic acid solution, <i>see</i> Diethylenetriamine pentaacetic acid, pentasodium salt solution.	III
Polyaluminum chloride solution	III
Potassium chloride solution (10% or more)(<i>see also the drilling brines entry</i>).	III
Sewage sludge, treated (<i>treated so as to pose no additional decompositional and fire hazard; stable, non-corrosive, non-toxic, non-flammable</i>).	#
Sludge, treated (<i>treated so as to pose no additional decompositional and fire hazard; stable, non-corrosive, non-toxic, non-flammable</i>).	#
Sodium acetate, Glycol, Water mixture (containing 1% or less, Sodium hydroxide) (<i>if non-flammable or non-combustible</i>).	#
Sodium aluminosilicate slurry	III
Sodium carbonate solution	D

Cargoes	Pollution Category
Sodium lignosulfonate solution, <i>see also</i> Lignin liquor.	III
Sodium naphthenate solution (free alkali content, 3% or less), <i>see</i> Naphthenic acid, sodium salt solution.	III
•Sodium poly(4+)acrylate solution	A
•Sodium silicate solution	C
•Sodium sulfate solution	III
Sorbitol solution	III
Tetrasodium salt of Ethylenediaminetetraacetic acid solution, <i>see</i> Ethylenediaminetetraacetic acid, tetrasodium salt solution.	D
1,1,1-Trichloroethane	C
1,1,2-Trichloro-1,2,2-trifluoroethane	C
Trisodium salt of N-(Hydroxyethyl)-ethylenediaminetriacetic acid solution, <i>see</i> N-(Hydroxyethyl)ethylenediamine triacetic acid, trisodium salt solution.	D
Urea, Ammonium mono- and di-hydrogen phosphate, Potassium chloride solution.	D
•Urea, Ammonium nitrate solution (2% or less NH ₃), <i>see also</i> Ammonium nitrate, Urea solution (2% or less).	D
•Urea, Ammonium phosphate solution, <i>see also</i> Ammonium phosphate, Urea solution.	D
Urea solution	III
Vanillin black liquor (free alkali content, 1% or less).	#
Vegetable protein solution (<i>hydrolysed</i>)	III
Water	III
•Zinc bromide, Calcium bromide solution, <i>see</i> Drilling brine (containing Zinc salts).	

Items with a bullet (•) or in **boldface** are changes since October 1, 1993.

Explanation of Symbols: As used in this table, the following stand for:

A, B, C, D—NLS Category of Annex II of MARPOL 73/78.

I—Considered an "oil" under Annex I of MARPOL 73/78.

III—Appendix III of Annex II (non-NLS cargoes) of MARPOL 73/78.

LFG—Liquefied flammable gas.

#—No determination of NLS status. For shipping on an ocean-going vessel, see 46 CFR 153.900(c).

[]—A NLS category in brackets indicates that the product is provisionally categorized and that further data are necessary to complete the evaluation of its pollution hazards. Until the hazard evaluation is completed, the pollution category assigned is used.

@The NLS category has been assigned by the U.S. Coast Guard, in absence of one assigned by the IMO. The category is based upon a GESAMP Hazard Profile or by analogy to a closely related product having an NLS assigned.

Abbreviations for Noxious liquid Cargoes:

N.F.—non-flammable (flash point greater than 60 degrees C (140 degrees F) cc).

n.o.s.—not otherwise specified.

ST—Ship type.

Cat—Pollution category.

[CGD 88-100, 54 FR 43584, Oct. 26, 1989; CGD 92-100, 59 FR 17044, Apr. 11, 1994, as amended by CGD 94-900, 59 FR 45142, Aug. 31, 1994; CGD 94-902, 60 FR 34043, June 29, 1995; CGD 95-900, 60 FR 34052, June 29, 1995]

APPENDIX I [RESERVED]

APPENDIX II—METRIC UNITS USED IN PART 153

Parameter	Metric (SI unit)	Abbre-viation	Equivalent to English or com-mon metric
Force	Newton	N	0.225 lbs.
Length	Meter	m	39.37 in.
.....	Centimeter	cm .....	.3937 in.
Pressure	Pascal	Pa	1.450×10^{-4} lbs/in ² .
.....	Kilo-Pascal (1,000 Pascals).	kPa	0.145 lbs/in ² .
Temperature .....	.....do	kPa	1.02×10^{-2} kg/cm ² .
Viscosity	Degree Celsius	°C	1×10^3 N/m ² .
.....	milli-Pascal sec-ond.	mPa. sec.	5/9 (°F-32).
Volume	Cubic meter	m ³	1.0 centipoise.
.....	.....do	m ³	264 gallons (gal).
.....	.....do	m ³	35.3 ft ³ .

[CGD 73-96, 42 FR 49027, Sept. 26, 1977, as amended by CGD 78-128, 47 FR 21212, May 17, 1982; CGD 81-101, 52 FR 7799, Mar. 12, 1987. Re-designated by CGD 92-100, 59 FR 17045, Apr. 11, 1994]

PART 154—SAFETY STANDARDS FOR SELF-PROPELLED VESSELS CARRYING BULK LIQUEFIED GASES

Subpart A—General

Sec.

- 154.1 Incorporation by reference.
- 154.3 Purpose.
- 154.5 Applicability.
- 154.7 Definitions, acronyms, and terms.
- 154.9 Issuance of documents.
- 154.12 Existing gas vessel: Endorsements and requirements.
- 154.15 U.S. flag vessel: Endorsement application.
- 154.17 U.S. flag vessel: Certificate of Inspection endorsement.
- 154.19 U.S. flag vessel: IMO certificate issuance.
- 154.22 Foreign flag vessel: Certificate of Compliance endorsement application.
- 154.24 Foreign flag vessel: IMO Certificate.
- 154.30 Liquefied gases not included in table 4.
- 154.32 Equivalents.
- 154.34 Special approval: Requests.
- 154.36 Correspondence and vessel information: Submission.
- 154.40 Right of appeal.